

SOUTHEASTERN BIOLOGY



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Robert Pleszewski, a graduate student with Dr. Gary Walker, Department of Biology, Appalachian State University, collects samples for his research on cliff ecology on the Gold Coast Wall in Linville Gorge. Photograph by Carrie Gass

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PURPOSE

The purpose of this association shall be to promote the advancement of biology as a science by encouraging research, the imparting of knowledge, the application of knowledge to the solution of biological problems, and the preservation of biological resources. The ASB has representation in Section G Committee of the AAAS. Varying types of membership are available to individuals and institutions. See inside back cover.

TIME AND PLACE OF FUTURE MEETINGS

2002 April 10-13 Appalachian State University, Boone, NC; see: <http://www.asb.appstate.edu/asb2002.htm>
2003 April 9-12 Howard University, Washington, DC.

A MESSAGE FROM THE PRESIDENT

Robert R. Haynes

This has been a productive year for ASB in several ways. First, we have joined with the Humboldt Research Institute to co-sponsor the *Southeastern Naturalist*, which is a sister journal to the *Northeastern Naturalist* that is published by the Institute. An Editorial Board of approximately 25 persons, many of which are ASB members, has been appointed. The first issue is scheduled to appear June 2002. According to Joerg-Henner Lotze, the Managing Editor, manuscripts are appearing at a rate of approximately one every three days. At this rate, we will easily be able to publish a full issue each quarter.

The *Southeastern Naturalist* already has appeared in the *Buyer's Guide to Scientific, Medical, and Scholarly Journals* for 2002, which is a subscription catalogue of more than 400 leading international scholarly and scientific journals. This appearance will give our new journal much needed advertisement.

Secondly, the ASB Executive Committee has voted to place the typeset of *ASB Bulletin/Southeastern Biology* at the University of Georgia library. Our archives are presently housed at the Emory University Library, but that institution's library policy does not allow for two copies of a journal. Consequently, they were not able to accept our typeset, which is a full, unbound set of the journal. Since the ASB's original meeting was at the University of Georgia, our Archivist, Dr. John Herr, approached that university about accepting our typeset, which they readily agreed to do. The Executive Committee would like for our archives and typeset to be at the same library, and the University of Georgia is interested in housing both of them. According to Article IX of our Constitution, however, the archives are to be maintained at Emory University. The Executive Committee, therefore, is going to propose an amendment to the Constitution, naming University of Georgia as the library for our archives. You will be asked to vote on this amendment at the Boone meeting.

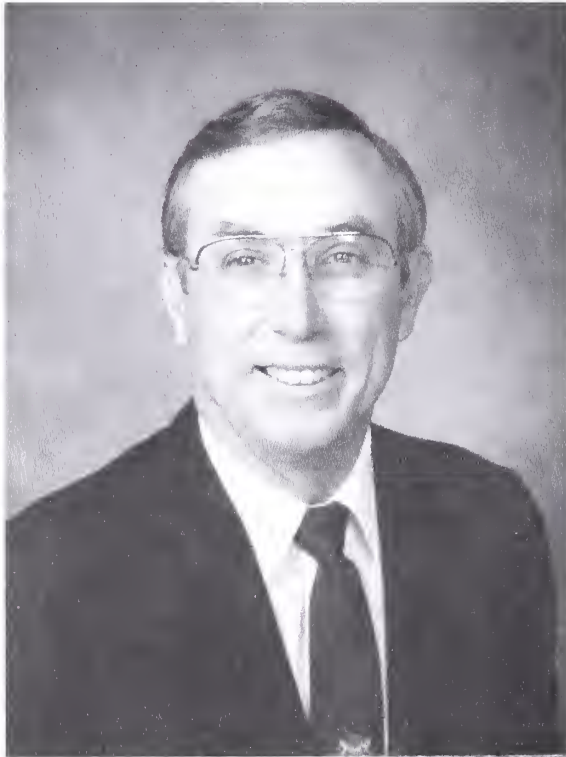
Thirdly, the membership voted last year for a Membership Officer to aid the Treasurer in maintaining the membership role. This person will receive the dues from our members and will keep the membership database current. This will leave the Treasurer to handle the money. According to Tim Atkinson, our Treasurer, the membership database is currently inadequate for use. Therefore, the first task of the new Membership Officer is to get the database in workable order. Since the first Membership Officer must work quite closely with the Treasurer in getting the database organized, I have appointed Ms. Debbie Atkinson, Tim's wife, to that position. Debbie is a long-time ASB member and is fully qualified for database management, since she is employed at the University of North Carolina, Chapel Hill to manage a large database. As I understand, progress is being made at getting the database organized.

Finally, I would like to discuss finances. For the past couple of years, we have barely been meeting expenses. Publication costs of the *Southern Biologist* have risen substantially, and we will not be able to cover many additional cost

increases. Our last dues increase, which was from \$15 to \$20, was in 1992. The Executive Committee has voted to recommend another five-dollar increase in dues, and you will be asked to vote on this recommendation at the Boone meeting.

As part of finances, I would like to mention our Enrichment Fund. I stated at the Annual Meeting in New Orleans that I wanted to emphasize increasing this fund during my tenure as President. I challenged the membership that I would match \$1000 donated by other members of the Association. Also, I appointed a new chairperson of our Enrichment Fund Board, Dr. Kim Marie Tolson. She is looking at avenues for increasing the Fund. Although I would like to keep my money, I do hope that enough of the membership takes up my challenge to total \$1000.

I hope each of you is making plans to attend the Boone meeting next April. I look forward to seeing you there.



President Robert R. Haynes

63rd ANNUAL MEETING BOONE, NORTH CAROLINA

The Department of Biology at Appalachian State University welcomes the Association of Southeastern Biologists to Boone for its 63rd Annual Meeting, April 10-13, 2002. A website, <http://www.asb.appstate.edu/asb2002.htm>, has been created for the meeting. Please visit this site for up-to-date information, maps, lodging information, and online registration.

SOCIETIES MEETING WITH ASB IN BOONE

American Society of Ichthyologists and Herpetologists, Southeastern Division
Beta Beta Beta, Southeastern District I
Beta Beta Beta, Southeastern District II
Botanical Society of America, Southeastern Division
Ecological Society of America, Southeastern Chapter
Society of Wetland Scientists, South Atlantic Chapter
Southeastern Society of Parasitologists
Southern Appalachian Botanical Society

ABOUT BOONE

Boone, a town of approximately 13,000 residents, is the commercial and financial center of Northwest North Carolina, and a prime tourist destination for those wanting to visit the High Country, as the region is known locally. The city sits at an elevation of 3300' (1100 meters) in the southern Appalachian Mountains, and is home to Appalachian State University, consistently one of the top-ranked public comprehensive universities in the country, and this year a *Time Magazine* "University of the Year." ASU is the largest employer in the region, followed by the tourist industry, and then closely by agriculture, which is dominated by Christmas tree growing. In fact, the High Country is the center for Christmas tree growing in the southeastern United States, and trees are shipped all over the country from here.

The High Country is home to four ski resorts, numerous planned communities, the Blue Ridge Parkway, Pisgah National Forest, Linville Gorge Wilderness Area, and Grandfather Mountain, a privately owned mountain that is also a Biosphere Reserve. Mt. Mitchell, the tallest peak in the eastern United States, is an easy two-hour drive along the Parkway from Boone. There are over 30 waterfalls in the area, lots of hiking trails and lakes, as well as numerous craft shops and historic sites. Watauga County, in which Boone is located, is noted for its progressive public school system, which consistently ranks among the best in the state.

April is a time of transition in the High Country. Winter may seem to be receding, but one can never be sure it's over, as snow has fallen here as late as the second week of May! Don't let that discourage you from coming though, as April can also be a time of great beauty. By mid-month many of the early season

wildflowers have begun blooming, and Boone is home to an abundance of species, including bloodroot, trout lily, and several species of trilliums to name but a few. In fact, there are more wildflower species in the southern Appalachians than in all of Europe. At this time of year some of the trees will also have begun leafing out, adding a touch of light green to the hills. Maximum and minimum temperatures average a comfortable 59°F and 40°F. A drive along the Blue Ridge Parkway, just a few miles east of town, will provide you with spectacular views of the Piedmont and foothills region. On clear days you can see over 70 miles, and with binoculars you can just make out the skyscrapers in Charlotte from the top of Grandfather Mountain.

The surrounding countryside is dotted with quaint, old-timey country stores, such as the Mast General Store in Valle Crucis, a National Historic Landmark and the Todd Store just north of Boone. In Ashe County, you can visit the Frescos, painted in Renaissance style by a local artist on the walls of several small country churches a short ride from Boone. Grandfather Mountain, a private park with an admission charge, has a small zoo, hiking trails, and spectacular views, and is located just 20 minutes from Boone. Both André Michaux and Asa Gray botanized on this mountain, which contains both rare and federally endangered species of plants and animals.

Being a tourist destination, Boone has many more restaurants than one might expect in a small rural area. Almost any cuisine can be found in the High Country, from fine dining to casual country eating, from wild game or traditional barbeque to Mexican or Japanese. A review of most of the restaurants will be provided in your registration packet. For more information on the Boone area, go to <http://www.boonechamber.com> for the Boone Area Chamber of Commerce's webpage.

APPALACHIAN STATE UNIVERSITY

Appalachian State University started off as a small mountain school to train teachers for the secondary schools in Appalachia. Two brothers, B.B. and D.D. Dougherty founded the school, which was first known as Watauga Academy. B.B. Dougherty became the first president in 1899, overseeing its growth and transition to Appalachian State Teachers College. When he retired in 1955 (no, that's not a typo, 1955!), B.B. Dougherty was both the oldest and longest serving college president in the country, and one reason why in 102 years, we've only had five Chancellors. In 1972, the school joined the newly formed state university system, and changed its name to Appalachian State University.

ASU currently has an enrollment of nearly 12,000 full-time students, of which 550 are graduate students, and hosts a full-time faculty of approximately 630 members. ASU prides itself on its commitment to teaching excellence, the promotion of scholarship, and service to the surrounding region, nation and international community. Class sizes are deliberately kept low, allowing students to get a level of personal attention from the faculty more characteristic of small colleges than a large university.

The Department of Biology at ASU comprises 24 faculty, over 30 graduate students, and 550 undergraduate majors, making it one of the more popular majors in the university. Faculty and student research encompasses a broad range of topics, from molecular biology to neurophysiology, immunology and cell biology, as well as conservation ecology, community and ecosystem ecology, animal behavior, air pollution effects, and systematics.

Students in the Department can gain expertise in the use of modern instrumentation and techniques in the molecular, biochemical, physiological, and ecological fields. There is also a strong emphasis on laboratory experiences, and field work. Students have the opportunity to take extended field trips to the southwest deserts, the coral reefs in Belize, and the islands of Hawai'i, where they study ecology and conservation biology. The Department offers programs of study leading to the B.A., B.S., M.A., and M.S. degrees. Both the M.A. and M.S. degrees emphasize independent research by the students, while undergraduates are strongly encouraged to do research with the faculty. For more information, please visit our web page at: <http://www.biology.appstate.edu/>.

DRIVING TO AND FROM BOONE

The best way to get to Boone is to drive, since the nearest airports are at least a two-hour drive away. Directions to Boone from any location can be found on the web at: <http://www.web.appstate.edu/asuinfo/maps/index.html>. Simply click on the state from which you are coming to display driving information.

MAP of BOONE and DESIGNATED MOTELS

A map showing lodging locations in Boone, as well the meeting site, can be found on the local ASB page at: <http://www.asb.appstate.edu/asb2002.htm> under the Lodging heading.

AIR TRAVEL DISCOUNTS AND FLIGHT RESERVATIONS

The Boone area is serviced by several international airports: Piedmont Triad International Airport located between Winston-Salem and Greensboro, NC, Douglas International Airport in Charlotte, NC, Tri-Cities Airport in Johnson City, TN, and Asheville Airport in Asheville, NC. All the airports are equally accessible to Boone and about a two-hour drive by car.

The official airlines for the workshop are **Delta** and **US Air**. They are providing a **10% discount** off the lowest supersaver fare if booked 70 days out, and 5% if 59 days or less. This includes a Saturday night stay over. To obtain this discount, call Michael Sexton or Sandy Kadyk at **Appalachian Travel** at **1-800-289-2848** and mention the Association of Southeastern Biologist meetings. Michael and Sandy will be happy to find you the best deal and will also book you a rental car if you want. Please note that there will not be any van service provided by the local arrangements committee to or from these airports. There are airport shuttles if you need them, and Michael or Sandy can arrange reservations for you.

ACCOMMODATIONS

The primary motel for the meeting is the Broyhill Inn and Conference Center located on the campus of Appalachian State University. The motel has recently been renovated with all new rooms and bedding and is the most convenient motel for the meeting. We encourage everyone to consider the Broyhill Inn first for their reservations because if we meet our room quota, then we get the use of the entire inn without charge. Other motels are located approximately 0.5 to 1.5 miles from campus. Attendees are responsible for making their own reservations. Please call the motel directly to reserve a room. The map on the next page shows the location of each motel in relation to the meeting site. For motel locations also see our web site: <http://www.asb.appstate.edu/asb2002.htm>.

To obtain the discount room rates, reservations must be made on or before March 10, 2002. Please mention that you will be attending the ASB (or Association of Southeastern Biologists) meeting to get the discount. Prices quoted do not include taxes, which add an additional 9% to the rates. All prices are for flat rates (1-4 people/room).

Primary Meeting Motel: Broyhill Inn and Conference Center 800-951-6048
 ASU Campus - meeting location 828-262-2204
 Room rates: \$92/night

Additional Motels (listed in order of proximity to campus, from closest to farthest away)

(Motel value/quality rated 1-4 stars)

Quality Inn***
 Approximately 1.0 miles from meeting location 800-903-8209
 Room Rates: \$59/night 828-262-0020

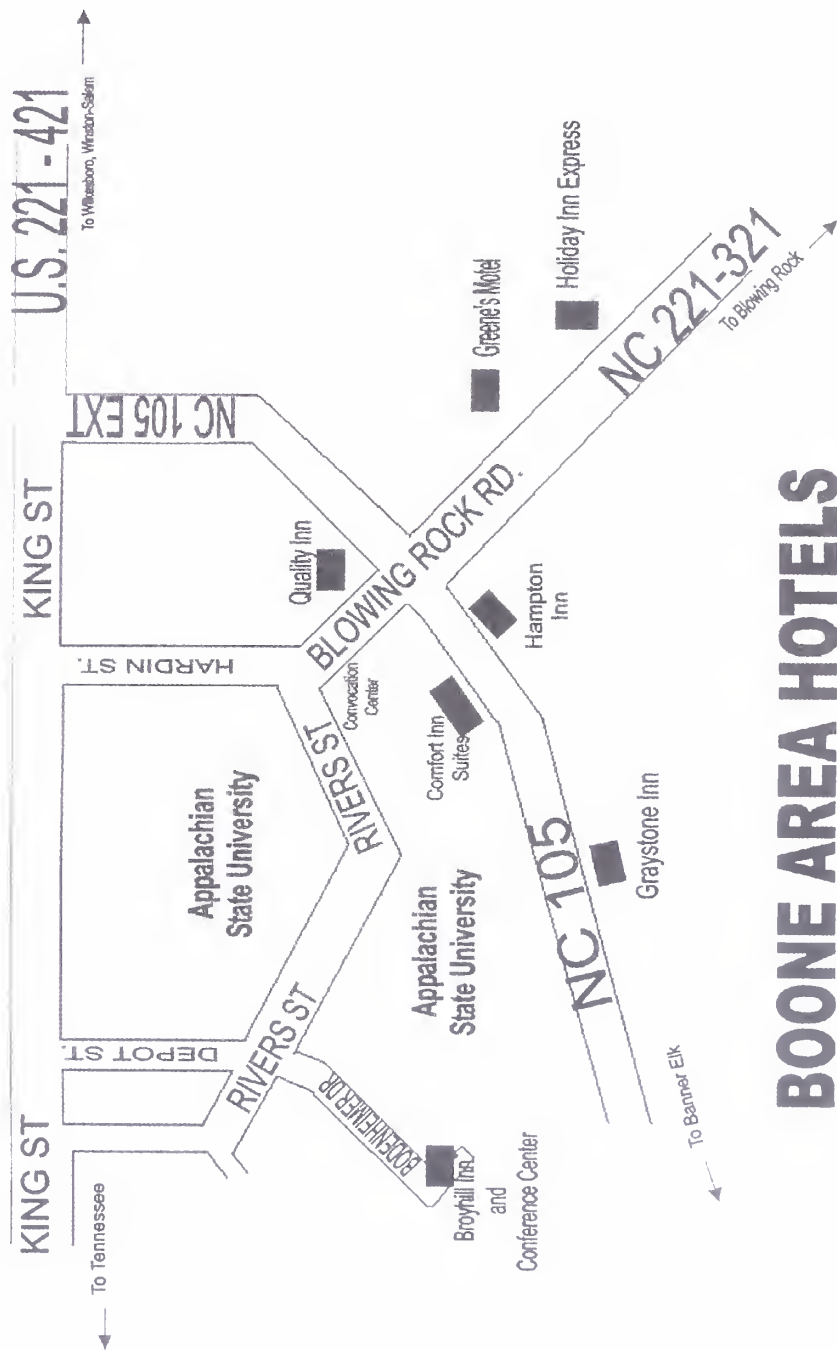
Hampton Inn*** 800-426-7866
 Approximately 1.0 miles from meeting location 828-264-0077
 Room Rates: \$79/night

Comfort Suites*** (toll free) 888-854-5959
 Approximately 1.0 miles from meeting location 828-268-0099
 Room Rates: \$82.50

Holiday Inn*** (brand new motel as of 2002) 800-465-4329
 Approximately 1.5 miles from meeting location 828-264-2451
 Room rates: \$65/night, W, Th; \$85/night, F, S

Greene's Motel*** No toll free number
 Approximately 1.5 mile from meeting location 828-264-8845
 Room Rates: \$45/night (local, family owned)

Graystone Lodge** 800-560-5942
 Approximately 2.0 miles from meeting location 828-264-4133
 Room Rates: \$40/night, W, Th; \$59/night, F, S



REGISTRATION FEES

	<u>Early</u>	<u>Late</u>
Regular ASB member	\$100	\$150
Regular Non-ASB member	\$120 (includes ASB membership)	\$170
Student ASB-member	\$ 50	\$ 75
Student Non-ASB member	\$ 60 (includes ASB membership)	\$ 85

EARLY: postmarked on or before February 22, 2002;

LATE: postmarked after February 22, 2002.

The registration fee includes all sessions, welcoming social, and refreshments during session breaks. A registration table will be set up in Alumni Hallway at the rear entrance of the Inn starting Wednesday, April 10 at noon, for picking up meeting materials and for late registration. Registration will be available through Friday morning.

Written notification of cancellation must be postmarked or faxed on or before April 2, 2002 to obtain a partial refund of the registration fee (a \$30-dollar processing fee will be retained). Refunds will not be made after April 2 for any reason. Substitute registrations can be made after April 2 by notifying the Office of Conferences and Institutes at 828-262-3045.

If you have not received notification of your registration by April 2, 2002, please contact the Office of Conferences and Institutes at 828-262-3045 to confirm your registration.

PROGRAM INFORMATION

The 63rd Annual Meeting will feature a plenary address on Wednesday, April 10, at 8 pm, by the noted paleontologist and dinosaur discoverer Jack Horner from the Museum of the Rockies. It will take place in the newly constructed Holmes Convocation Center, located on the main campus. Vans will shuttle people from their motels to the plenary session for those who do not want to walk. Following this will be a welcoming social back at the Broyhill Inn. Two symposia and three workshops are currently scheduled. The symposia will focus on such topics as biotechnology and on the management of federal lands. The workshops will include one hosted by McGraw-Hill on Wednesday afternoon, one by Carolina Biological Supply Company, and one jointly hosted by the ASB Education Committee and Prentice-Hall on Teaching Biology (see below for more detail). There will be the usual contributed paper and poster sessions, and Thursday evening there will be a BBQ and social in the Holmes Convocation Center (complete with libation, bands, and dancing), followed by the Awards Banquet on Friday in the Broyhill Inn. A number of field trips are planned for Saturday to sites of ecological interest in the High Country, and during the week we have two additional trips planned specifically for spouses, one to the Biltmore House and Gardens, the largest house in America, and another around the High Country near Boone.

TEACHING BIOLOGY WORKSHOP

SPONSORED by the ASB EDUCATION COMMITTEE

and PRENTICE-HALL PUBLISHERS

A half-day workshop on teaching biology is being organized by the ASB Education Committee and Prentice-Hall and will include presentations on "active learning techniques," "what do you teach, how do you teach it and why," and a lunch/panel discussion on "depth vs. breadth for non-majors." Prentice-Hall is sponsoring the speakers and will provide lunch for workshop registrants. If you would like to attend, please check the box provided on the registration form. There is no cost for this symposium.

TENTATIVE PROGRAM

WEDNESDAY, APRIL 10

Registration.....	Noon - 5:00 PM
Poster/Exhibitor Set-up.....	Noon - 5:00 PM
ASB Executive Committee Meeting	2:00 - 6:00 PM
McGraw-Hill Technology Workshop	2:00 - 5:00 PM
SABS Council Meeting	2:00 - 6:00 PM
ASB Plenary Session	7.30 PM
Welcome and Announcements by Local Committee	
Plenary Lecture by Jack Horner	
ASB Wednesday Evening Social	9:30 - 11:00 PM

THURSDAY, APRIL 11

ASB Past Presidents' Breakfast	7:00 - 8:30 AM
Poster/Exhibitor Set-up.....	7:00 - 8:30 AM
Slide Previewing	8:00 AM - 5:00 PM
Registration.....	8:00 AM - 5:00 PM
Field Trip to Biltmore House and Gardens	8:00 AM - 5:00 PM
Paper and Poster Sessions	8:00 AM - 6:00 PM
Commercial Exhibits	8:30 AM - 5:00 PM
Symposium.....	8:00 AM - Noon
Carolina Biological Supply Co. Workshop.....	9:00 AM - 5:00 PM
SWS/SAC Luncheon Meeting	Noon - 1:30 PM
Beta Beta Beta Luncheon and Field Trip	11:30 AM - 5:00 PM
ASIH SE Division Business Meeting	5:00 - 5:30 PM
ASB Social.....	7:00 - 11:00 PM

FRIDAY, APRIL 12

SABS/BSA - SE Section Breakfast/Business Meeting.....	7:00 - 8:30 AM
Slide Previewing	8:00 AM - 5:00 PM
Registration.....	8:00 AM - Noon
Commercial Exhibits	8:30 AM - Noon
Paper and Poster Sessions	8:00 AM - 6:00 PM

ASB Education Committee/Prentice-Hall Teaching Workshop	9:00 AM - 1:00 PM
Sightseeing/shopping in the High Country	9:00 AM - 3:00 PM
Beta Beta Beta	
Officers' & Judges' Meeting	8:00 - 9:00 AM
Poster Session	9:00 - 10:00 AM
Beta Beta Beta Business Meeting I	10:00 - 11:00 AM
Symposium	8:00 - 11:30 AM
ASB Business Meeting and Election of Officers.....	11:30 AM - 12:30 PM
ESA - SE Chapter Luncheon and Business Meeting	12:30 - 2:00 PM
Roundtable Discussion on Mountain Bogs, sponsored by SABS	2:00 - 4:00 PM
Herbarium Curators Meeting	4:00 - 5:00 PM
Beta Beta Beta	
District Meetings	4:30 - 5:00 PM
Joint Business and Award Meeting	5:00 - 5:30 PM
ASB Social Hour and Cash Bar	6:00 - 7:00 PM
ASB Award Banquet	7:00 - 9:00 PM
ASB Wind Down	9:00 - 10:30 PM

SATURDAY, APRIL 13

ASB Executive Committee Meeting	7:30 - 10:30 AM
ASB Field Trips.....	Beginning at 8:00 AM

**ASB 2002 FIELD TRIPS
BOONE, NORTH CAROLINA**

GENERAL INFORMATION

We have nine trips planned for meeting attendees. The six Saturday trips offer exciting looks at both terrestrial and aquatic ecosystems in the southern Appalachians. Most of these trips will take ½ to a full day's time, and lunch and transportation are included in the price of a ticket. The other three trips will be on Thursday and Friday: one to the Biltmore House and Gardens, one to Grandfather Mountain for the Beta Beta Beta attendees, and the other will be shopping/ sightseeing trip around destination sites in the High Country. We encourage you take advantage of these trips, most of which will be led by local faculty or their graduate students.

As mentioned earlier, the weather in April can be highly variable, meaning it could be nice, rainy, or even snowy. Those going to high elevation sites, such as Mt. Mitchell and Roan Mountain, need to be prepared for very cold and possibly wet weather. But even those going on the other trips should bring plenty of warm clothes and rain gear, just in case.

Space is very limited on all trips. When you register, please indicate your first, second and third choices for trips. We will try to accommodate your first choices where possible. Registration is on a first come, first served basis and only guaranteed after receipt of full payment. Cancellations for a full refund must be received in writing (by mail or fax) prior to April 2. Please check the website for trip availability. If a trip has not filled, registration for it will be kept open through departure.

TRIP 1 - ROAN MOUNTAIN

Roan Mountain is the site of one of the few intact high elevation, spruce-fir forests in the southeastern U.S. This ecosystem is considered the second most endangered in the U.S. Roan Mountain also has extensive, high elevation grassy balds. These unique communities have been the focus of considerable ecological research, particularly with regards to their origin and maintenance. Participants on this trip will visit these habitats and hear about the research being conducted there.

Leader: Coleman McCleneghan **Difficulty:** Moderate (some hiking involved)
Min: 10 **Max:** 24 **Trip duration:** 6-8 hours

TRIP 2 - BIRDWATCHING and BOTANIZING in LINVILLE GORGE

The Linville Gorge Wilderness Area is an interesting site both from a geological perspective and an ecological one. The first wilderness area in the eastern United States, it contains many unique plant communities, many of which are fire dependent. Last year, nearly 8,000 acres burned, so you will also get to see the impacts of ground-level fires on the forests. In addition, there are unique cliff-face communities, and researchers from ASU recently found a new species of lichen on the cliffs. Finally, the gorge has many interesting plant and animal species, particularly bird species. Walk the gorge, enjoy the beautiful vistas, and look and listen for birds.

Leader: Jason Riddle and others **Difficulty:** Difficult--very steep trails
Min: 5 **Max:** 27 **Trip duration:** 6-8 hours

TRIP 3 - GRANDFATHER MOUNTAIN

Hike up one of the highest mountains in the southeastern U.S., Grandfather Mountain. This rugged peak has high elevation heath communities, rock outcrop communities, spruce-fir forests and northern hardwood forests. It is the only privately owned Man and Biosphere Reserve. Important both historically and ecologically, the mountain is home to many unique species of plants and animals, and houses several rare and endangered species, including Heller's Blazing Star and the Northern Flying Squirrel. An isolated peak in the Blue Ridge, it was explored botanically in the 18th and 19th centuries by such noted botanists as André Michaux and Asa Gray. Rising to over 5,000', the mountain offers spectacular hiking and recreation, and has a small zoo, nature museum, and a suspension bridge at the very top. On a clear day with binoculars you can see the skyscrapers in Charlotte, nearly 100 miles away.

Leader: Ray Williams **Difficulty:** Moderate-Difficult
Min: 5 **Max:** 24 **Trip duration:** 8 hours

TRIP 4 - ROUGH RIDGE

This is a less strenuous hike than the one up Grandfather Mt. but there are still many beautiful views of the Blue Ridge and the Appalachian foothills. This trip also passes through an environmentally-sensitive, high-elevation heath bald community. For those interested in botanizing, this will be one trip not to miss.

Leader: Zack Murrell
Min: 5 Max: 24

Difficulty: Moderate (some hiking involved)
Trip duration: 4 hours

TRIP 5 - STREAM ECOLOGY

The sources of the both the New River and the Watauga River are in the vicinity of Boone. On this trip we will visit sites in both watersheds. There will be discussions of the streams and the interesting taxa that inhabit them, as well as discussion of ongoing research projects in these watersheds. This will also be a collection trip for those interested in aquatic invertebrates so bring vials, kicknets and waders.

Leader: Robert Creed
Min: 5 Max: 14

Difficulty: Easy-Moderate
Trip duration: 6-8 hours

TRIP 6 - MT. MITCHELL STATE PARK

Mt. Mitchell State Park, named after Elisha Mitchell, the great 19th century naturalist, is North Carolina's oldest state park, and Mt. Mitchell itself is the highest peak in the eastern United States. Adjacent to the Blue Ridge Parkway, the forests grade from northern hardwood at the base to spruce-fir as one approaches the summit. Much of the high elevation forests was decimated by logging at the turn of the century, and subsequently by the balsam woolly adelgid. Although much has been written about the potential impacts of acidic deposition at this site, discussion on the trip will point out the controversy of such thinking. There are abundant hiking trails, and we'll investigate the status of the spruce-fir forests on the mountain, thought to be the second most endangered ecosystem in the U.S.

Leader: To Be Announced
Min: 5 Max: 24

Difficulty: Easy-Moderate
Trip duration: 6-8 hours

TRIP 7 - BILTMORE HOUSE and GARDENS

George Vanderbilt built this, his summer home, just after the turn of the century. Set on an original 125,000 acres of land, which included neighboring Mt. Pisgah, the estate today still encompasses nearly 7,000 acres of land, located just south of Asheville, NC, and is the most popular tourist attraction in the southern Appalachians. This is where Gifford Pinchot, America's first professional forester, began practicing scientifically based forestry in the United States. In addition to

the house, the estate contains beautiful gardens, a winery, a brand new chateau, and lots of pasture land, all adjoining the French Broad River. The centerpiece, though, is the 100,000 ft² house that Vanderbilt had constructed. The home is an architectural masterpiece, and often used as a backdrop for films, especially when the story calls for a castle. This trip will leave at 8 AM on Thursday, and costs \$70, which covers the price of admission to the estate, transportation and a box lunch. Estimated return time will be around 5 PM. The trip leader will be a retired faculty member from ASU. This was a very popular trip last time we hosted ASB!

Leader: To Be Announced
Min: 15 Max: 45

Difficulty: Easy
Trip duration: 8-9 hours

TRIP 8 - SIGHTSEEING and SHOPPING in the HIGH COUNTRY

The High Country is home to many mountain craftspeople, as well as unique shops not found anywhere else. This trip, which leaves at 9 AM on Friday, will take people around to the major attractions of the High Country. There will be stops to see The Frescos, paintings done in Renaissance style and which adorn the walls of several country churches, as well as stops at mountain craft shops and notable country stores, including the Mast and Todd General Stores, both National Historic Landmarks. Some time will also be spent in Blowing Rock, a major tourist destination spot. A drive along the Blue Ridge Parkway will allow attendees to experience the beauty of the Parkway, and while there, you'll have a chance to stop at the Southern Highlands Craftshop located in the old Cone Manor Estate, just south of Blowing Rock. Trip costs cover transportation and a box lunch. Estimated return time is between 4 and 5 PM.

Leader: Carolyn Shull
Min: 5 Max: 24

Difficulty: Easy
Trip duration: 6-7 hours

TRIP 9 - BETA BETA BETA FIELD TRIP to GRANDFATHER MOUNTAIN

Participants in Beta Beta Beta will take a field trip to Grandfather Mountain on Thursday, leaving at 11:30 AM and returning about 5 PM. Trip costs include admission to Grandfather Mountain, a box lunch, and transportation. Grandfather Mountain is a privately owned preserve, owned by Hugh Morton. This historically and ecologically important mountain is home to many unique species of plants and animals, and houses several Federally endangered species, including Heller's Blazing Star and the Northern Flying Squirrel. An isolated peak in the Blue Ridge, it was explored botanically in the 18th and 19th centuries by such noted botanists as André Michaux and Asa Gray. Rising to over 5,000', the mountain offers spectacular hiking and recreation, and houses a small zoo, nature museum, and a suspension bridge at the very top. On the clearest of days, you can see the skyscrapers in Charlotte with binoculars.

GEAR AND DRESS FOR ALL FIELD TRIPS

The following should be a clear reminder that all field trips require proper gear and dress. Please take note of the following recommendations:

- First and foremost, remember that the weather at this time of year can be quite variable, ranging from tee-shirt temperatures to winter jacket temperatures. Bring along appropriate cold and wet weather clothes. Those going to high elevation sites definitely need to prepare for low temperatures. Also, it could be raining or snowing, so bring along rain gear and good footwear.
- Wear long pants and bring a hat, sunglasses and gloves
- Insect repellent may or may not be needed--bugs are usually not a major problem at this time of year, but better to be prepared. If you are allergic to bee stings, please let people know, and make sure you have a bee sting kit with you
- Don't forget to bring cameras, VCR's, and field guides
- Box lunches and drink will be provided. But you should also bring additional snacks if you want, plus plenty of drinking water. Don't count on being able to stop and purchase snacks and drinks as the trips need to stay on schedule!

DEPARTURE AND RETURN TIMES

Several special notes:

- Be on time for departure. Trips will leave at their scheduled times. All trips leave from the rear entrance of the Broyhill Inn.
- Each trip is subject to cancellation if there is not sufficient interest. You will be notified prior to the meeting if your trip has been canceled, or if you have been transferred to another trip. If we cancel a trip, you will receive a full refund.
- If you miss a trip, there will be no refund.
- Finally, return times are only approximate.

REGISTRATION FORM
(One form per registrant)

ASB – ASSOCIATION OF SOUTHEASTERN BIOLOGISTS
63rd Annual Meeting
Hosted by Appalachian State University
Boone, NC
April 10–13, 2002

Name _____

☐ Regular ☐ Graduate Student ☐ Undergraduate Student

Institution _____

Mailing Address _____

City _____ State _____ Zip _____

Office/Day Phone (____) _____

E-Mail _____

Affiliation (Check where appropriate)

- | | | | |
|---------------------------|----------------------------|----------------------------|-------------------------------|
| <input type="radio"/> ASB | <input type="radio"/> ASIH | <input type="radio"/> BBB | <input type="radio"/> BSA |
| <input type="radio"/> ESA | <input type="radio"/> SFC | <input type="radio"/> SABS | <input type="radio"/> SWS/SAC |

Early ASB member	\$100	<input type="text"/>
Early Non-ASB member (includes ASB membership).....	\$120	<input type="text"/>
Late ASB member	\$150	<input type="text"/>
Late Non-ASB member (includes ASB membership).....	\$170	<input type="text"/>
Early Student ASB member	\$ 50	<input type="text"/>
Early Student Non-ASB member (includes ASB membership).....	\$ 60	<input type="text"/>
Late Student ASB member	\$ 75	<input type="text"/>
Late Student Non-ASB member (includes ASB membership).....	\$ 85	<input type="text"/>

EARLY: Postmarked on or before February 22, 2002;
LATE: Postmarked after February 22, 2002

- ☐ Yes, I plan to attend the Wednesday Evening Welcoming Social
- ☐ Yes, I plan to attend the Education Committee's symposium on "Teaching Biology" (sponsored by Prentice-Hall, lunch will be provided)

SWS/SAC Travel Funds for graduate students presenting a wetlands paper:
The South Atlantic Chapter of the Society of Wetlands Scientists has funds available to support travel by graduate students presenting a paper on a wetlands topic. If you wish to apply for these funds, indicate the title, authors of paper and check the circle below:

☐ I wish to apply for SWS/SAC travel funds.

Authors/Title:

Thursday Evening Social at the Holmes Convocation Center

Regular: \$30.00 x tickets \$

Student: \$20.00 x tickets \$

Friday Evening ASB Banquet:

Regular: \$35.00 x tickets \$

Student: \$25.00 x tickets \$

Breakfasts:

SABS/BSA: \$15.00 x tickets \$

SE Society of Parasitologists \$15.00 x tickets \$

ASB Past President's: (no charge). Please reserve tickets

Executive Committee: (no charge). Please reserve tickets

Luncheons:

Southern Division of ASIH \$15.00 x tickets \$

SE Chapter of ESA \$15.00 x tickets \$

S. Atlantic Chapter of SWS \$15.00 x tickets \$

Tri-Beta (see Field Trip # 9)

Dietary Preference (vegetarian, etc.):_____

Field Trips: Please indicate your first, second, and third choices and pay only for your first choices. Be sure you have provided your e-mail address at the beginning of this registration.

Destination	Price/Quantity	Total Cost	Choice
1. Roan Mountain Trip (Sat.)	\$15.00 x _____ tickets _____	\$ _____	_____
2. Bird Watching in Linville Gorge Wilderness Area (Sat.)	\$15.00 x _____ tickets _____	\$ _____	_____
3. Hike on Grandfather Mt. (Sat.)	\$15.00 x _____ tickets _____	\$ _____	_____
4 Hike to Rough Ridge (Sat.)	\$15.00 x _____ tickets _____	\$ _____	_____
5. Stream Ecology Trip (Sat.)	\$15.00 x _____ tickets _____	\$ _____	_____
6. Mt. Mitchell Trip (Sat.)	\$15.00 x _____ tickets _____	\$ _____	_____
7. Biltmore House Trip (Thu.)	\$70.00 x _____ tickets _____	\$ _____	_____
8. Tour of High Country (Fri.)	\$15.00 x _____ tickets _____	\$ _____	_____
9. Tri-Beta Trip to Grandfather (Thu.)	\$15.00 x _____ tickets _____	\$ _____	_____
TOTAL AMOUNT ENCLOSED _____		\$ _____	
(registration, events and field trips)			

Payment Method : (Payment must accompany the registration form.)

☐ Check (payable to ASU) ☐ MasterCard ☐ Visa
(There is a \$25 charge for returned checks.)

Credit Card Number

Card Holder's Name _____ Expiration Date _____

Signature_____

You may FAX your registration with credit card information to: (828) 262-4992.
If you **FAX** your registration, **DO NOT** mail it.

Mail registration form and payment to:

Association of Southeastern Biologists
A.S.U. Conferences and Institutes
PO Box 32042
Boone, NC 28608-2042

Phone: (828) 262-3045
Fax: (828) 262-4992
E-mail: johnsnjw@appstate.edu

OR GO TO:
www.asb.appstate.edu/asb2002.htm
AND REGISTER ONLINE

REFUND POLICY: Refunds will be subject to a \$30.00 processing charge until April 2, 2002. No refunds will be made after April 2, 2002, but substitute registrations can be made by notifying the Office of Conferences and Institutes at 828-262-

**For Office Use Only
Course Code 02ASB**

☐ Check Total Due _____
☐ Cash Deposit Rec'd _____
☐ CC Balance Due _____
 Date Rec'd _____

LOCAL ARRANGEMENTS COMMITTEE

(FAX number for all committee members is 828-262-2127)

Local Arrangements Chair	Howard Neufeld	neufeldhs@appstate.edu 828-262-2683
Program Chair	Ken Shull	shulljk@appstate.edu 828-262-2675
Program Co-Chairs	Mary Connell	connellmu@appstate.edu 828-262-2671
	Skip Sedivec	sedivecmj@appstate.edu 828-262-2679
Beta Beta Beta	Dru Henson	hensonda@appstate.edu 828-262-2673
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	Robert Creed	creedrp@appstate.edu 828-262-6512
Posters and Audiovisual	Michael Windelspecht	windlspchtm@appstate.edu 828-262-2680
Registration and Meeting Statistics	Jan Johnson	johnsnjw@appstate.edu 828-262-2924
		FAX: 828-262-4992
Social Committee	Gary Walker	walker@appstate.edu 828-262-2672
Transportation and Volunteers	Matthew Rowe	rowemp@appstate.edu 828-262-2676

AMENDMENTS TO THE ASB CONSTITUTION AND BYLAWS

The Executive Committee has agreed upon the need for preserving a "type set" of the ASB Bulletin and that this type set should be housed at the same location as the ASB Archives. The ASB Constitution and Bylaws indicates the ASB archives shall be housed at Emory University, which will not keep a type set of the bulletin. Librarians in charge of Special Collections and Archives at both Emory and the University of Georgia have suggested that the type set and archives should be at the same institution, and they are in complete agreement that the location should be the University of Georgia. Accordingly, the Executive Committee recommends to the membership that the archives along with a type set of the ASB Bulletin be relocated to the University of Georgia who has graciously agreed to house both the archives and the bulletin type set. Appropriately, ASB began at UGA over 50 years ago. In order to accommodate this move the ASB Executive Committee proposes the following amendment to the Association of Southeastern Biologists Constitution and Bylaws to be voted on at the April 2002 meeting in Boone.

Article IX of the Association of Southeastern Biologists Constitution currently reads as follows:

"Article IX - Archives

The Archives of The Association of Southeastern Biologists shall be maintained permanently at Emory University, Atlanta, Georgia."

The ASB Executive Committee proposes Article IX be amended to read:

"Article IX - Archives

The Archives of The Association of Southeastern Biologists shall be maintained permanently at **the University of Georgia, Athens, Georgia.**"

Also, for clarification, the ASB Executive Committee proposes the following amendment to the Association of Southeastern Biologists Constitution and Bylaws to be voted on at the April 2002 meeting in Boone.

Article VII, Section 2, Part H of the Association of Southeastern Biologists Bylaws currently reads as follows:

"Article VII

Section 2

- H. The Meritorious Teaching Award Committee may each year select a member of the Association to receive the award for meritorious teaching."

The ASB Executive Committee proposes Article VII, Section 2, Part H be amended to read:

"Article VII

Section 2

- H. The Meritorious Teaching Award Committee may each year select a member of the Association to receive the award for meritorious teaching **at the college level.**"

THE *SOUTHEASTERN NATURALIST*

On schedule, with the first issue to be available in time for the ASB meeting in Boone, NC in 2002!

- A peer-reviewed and edited interdisciplinary scientific journal with a regional focus on the southeastern United States (ISSN 1528-7092).
- Featuring research articles and notes on terrestrial, freshwater, and marine organisms, and their habitats.
- Focusing on field ecology, biology, behavior, biogeography, wildlife and fisheries management, taxonomy, evolution, anatomy, physiology, geology, and related fields.
- A sister journal of the *Northeastern Naturalist*, published since 1997. Both journals are identical in focus, format, quality, and features. The journals together serve as a matched-pair of regional journals that provide an integrated publishing and research resource for the eastern part of North America.
- Starting with volume 1(1), will be indexed in Cambridge Scientific Abstracts, EBSCOhost, FISHLIT (Fish and Fisheries Worldwide; Aquatic Biology, Aquaculture, and Fisheries Resources), Wildlife Review Abstracts, and Zoological Record (BIOSIS UK). Arrangements for indexing in Biological Abstracts (BIOSIS) and other services pending publication of first issue.
- Printed by Allen Press, printer of many journals in the biological and environmental sciences, especially those whose parent organization is a member society of AIBS.
- Starting with volume 1(1), will be available online in full-text version in the BioOne database (www.bioone.org, a collaborative effort of Allen Press, AIBS, et al.) and the Proquest Information and Learning databases (www.il.proquest.com).

The *Southeastern Naturalist* welcomes your interest as a subscriber and as an author!

Subscription cost, 1 year, 4 issues, US addresses:

- ☐ Individual - \$40 (-20% = \$32 with 1st-time subscriber or ASB member discount).
 - ☐ Institution - \$60 (-20% = \$48 with 1st-time subscriber discount).
 - ☐ Student - \$30 (-20% = \$24 with 1st-time subscriber or ASB member discount).
- Student Institution _____

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Payments may be made by check, money order, or credit card.

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Southeastern Naturalist, Humboldt Field Research Institute, P. O. Box 9, Steuben, ME 04680-0009. Phone 207-546-2821, FAX 207-546-3042, humboldt@loa.com.

AIBS Information

TO: AIBS membership and contacts

FROM: Richard O'Grady, AIBS Executive Director, on behalf of the AIBS
Board of Directors and AIBS staff

Registration for next year's AIBS Annual meeting is now open. We encourage you to attend and participate in this innovative, informative, and timely program. Seating is limited, so register early!

[**Note** to presidents, executive directors, and council representatives of AIBS member societies and organizations. The 2002 AIBS Council meeting will be held in the same location as the AIBS Annual meeting, on the following day, Monday, 3/25/02. Agenda details and an RSVP form for the Council will soon be emailed to you.]

PROGRAM * SCHEDULE * REGISTRATION * POSTER SUBMISSIONS

2002 ANNUAL MEETING OF THE AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES 22- 24 MARCH 2002

EVOLUTION: UNDERSTANDING LIFE ON EARTH

Nothing makes sense in biology except in the light of evolution.

--Theodosius Dobzhansky (*American Biology Teacher* 35:125-9; 1973)

Register and/or submit a poster via www.aibs.org or directly at www.aibs.org/meeting2002/index.ldml. Need help registering? Call 703-790-1745 or 800-992-2427, email: meeting2002@aibs.org. Early registration prices in effect until 1 March 2002.

All sessions take place in the Key Bridge Marriott Hotel (across the Key Bridge from Georgetown, DC, in the Washington DC metro area)

SUMMARY: The 2002 AIBS Annual meeting presents an excellent opportunity for biologists to share the latest developments in evolution research, education, and applications to today's world. Attendees will hear distinguished plenary speakers present synthesizing lectures from the forefront of their fields, then will join those speakers and other equally notable scholars in informal discussion groups. Group topics include the plenary subjects as well as broader pedagogical and social aspects of contemporary evolutionary biology. The rest of the AIBS meeting's program is rounded out by events such as a session on online resources for research and education; a session on the central role of organismal biology; contributed posters; a diversity scholars competition; and a presentation

by Darwin scholar and stage performer Richard Milner of his popular musical, *Charles Darwin: Live and in Concert*.

The meeting runs from 6 p.m., Friday, 3/22/02 to 5:30 p.m., Sunday, 3/24/02

Contact the Key Bridge Marriott Hotel directly to arrange for accommodations: 1401 Lee Highway, Arlington VA 22209, www.marriotthotels/waskb, 1-703-524-6400 or 1-800-228-9290.

PROGRAM CONTENT

(update and expanded, November 2001)

PLENARY SPEAKERS:

Vagaries of the Molecular Clock

Francisco Ayala, University of California-Irvine

Understanding How Life Diversifies: Speciation and Earth History

Joel Cracraft, American Museum of Natural History

What Drives Evolution?

Niles Eldredge, American Museum of Natural History

Establishing Principles and Generalizations in Evolutionary Biology

Douglas Futuyma, State University of New York-Stony Brook

What Darwin's Finches Can Teach Us About Evolution

Peter and Rosemary Grant, Princeton University

Can the Lemurs Save Madagascar? National and Global Attitudes toward an Evolutionary Radiation

Alison Jolly, University of Sussex

The New Integration of Developmental and Evolutionary Biology

Paula Mabee, University of South Dakota

How Humans Control the Evolution of Resistance and Virulence of Infectious Organisms

Stephen R. Palumbi, Harvard University

Species, Speciation, and Macroevolution

Loren Rieseberg, Indiana University

What's New in the Anti-evolution Movement?

Eugenie Scott, National Center for Science Education

DISCUSSION GROUPS:

There are nine discussion groups, with no formal presentations; rather, the leaders will facilitate informal discussion of the topic with the attendees by, e.g., identifying three or four core aspects to be addressed.

Replication in Evolutionary Biology Studies

Leaders: Richard Borowsky, New York University
Douglas Futuyma, State University of New York-Stony Brook

Genomics and Development

Leaders: Francisco Ayala, University of California-Irvine
Paula Mabey, University of South Dakota

Conservation and Population Biology

Leaders: Peter and Rosemary Grant, Princeton University
Harry Greene, Cornell University
Alison Jolly, University of Sussex
Loren Rieseberg, Indiana University

Evolution, Infection, and Biology as a Weapon

Leader: Stephen Palumbi, Harvard University

Formal Education: K-16

Leaders: Rodger Bybee, Biological Sciences Curriculum Study
John Jungck, BioQUEST Curriculum Consortium
M. Patricia Morse, University of Washington
Craig Nelson, Indiana University

Public Education: Print and Broadcast Media

Leaders: Niles Eldredge, American Museum of Natural History
Joe Levine, Science Editor, PBS series, *Evolution*
Carl Zimmer, Natural History magazine; author of *Evolution: The Triumph of an Idea*

Public Education: Museums, Zoos, Aquaria, Science Centers

Leaders: Valerie Chase, National Aquarium in Baltimore
Joel Cracraft, American Museum of Natural History

Faith-based Issues

Leaders: Francisco Ayala, University of California-Irvine
Connie Bertka, Dialogue on Science, Ethics, and Religion, American Association for the Advancement of Science
Kenneth R. Miller, Brown University; author of, *Finding Darwin's God: A Scientist's Search for Common Ground Between God and Evolution*
Eugenie Scott, National Center for Science Education

Public Policy and Politics

Leaders: David Applegate, American Geological Institute
Eugenie Scott, National Center for Science Education
AIBS staff members

LUNCH-BREAK SESSIONS:

Organisms as the central focus of research and education in biology
by Harry Greene, Cornell University

Online Resources for Evolution Research and Education: EvoNet and others

AWARDS:

AIBS Distinguished Scientist Award

To be presented to Stephen Jay Gould, Harvard University

AIBS Outstanding Service Award

To be presented to Eugenie C. Scott, National Center for Science Education

AIBS Education Award

To be presented to John A. Moore, Univ. of CA - Riverside, author of
"Science as a Way of Knowing"

AIBS Media Awards

AIBS Diversity Scholars Award

(enter a poster at www.aibs.org/meeting2002/index.ldml)

AIBS Student Poster Award

SPECIAL EVENT:

Charles Darwin: Live and in Concert -- see Darwin brought to life by
historian of science, songwriter, anthropologist, author, and entertainer,
Richard Milner, in a one-of-a-kind musical theater experience.

Faculty Positions Open

The Appalachian State University, Department of Biology, is now accepting applications for the following two positions:

Appalachian State University, a Time magazine "College of the Year," is a comprehensive university with an enrollment of 12,500. The Biology Department (www.biology.appstate.edu) currently has 22 faculty, over 500 majors, and 31 graduate students. We are committed to an extensive laboratory and field experience for our majors. The Department invites applications for two tenure-track faculty positions: Invertebrate Biologist/Physiologist and Microbiologist/Prokaryotic Biologist. Candidates must have a strong commitment to undergraduate and graduate education. Responsibilities include teaching, developing a program of scholarship involving undergraduate and graduate students, and seeking extramural funding. A Ph.D. is required. Submit a letter of application, curriculum vitae, description of teaching and research interests, statement of teaching philosophy, and names, addresses, telephone numbers, and email addresses of three references by December 3, 2001.

Invertebrate Biologist/Physiologist Candidates must be broadly trained in invertebrate biology and familiar with the evolutionary relationships and physiology of invertebrates. Teaching responsibilities include an undergraduate course in invertebrate biology from an organismal perspective, as well as an upper level course in invertebrate physiology. Submit materials to Dr. Robert Creed, Department of Biology, Appalachian State University, 572 Rivers Street, Boone, NC 28608-2027. E-mail: creedrp@appstate.edu.

Microbiologist/Prokaryotic Biologist Candidates must be broadly trained in microbial and molecular biology. Teaching responsibilities include undergraduate courses in microbiology and a graduate course in his/her area of speciality. Submit materials to Dr. Mark Venable, Department of Biology, Appalachian State University, 572 Rivers Street, Boone, NC 28608-2027. E-mail: venableme@appstate.edu.

Appalachian State University is an Equal Opportunity Employer.

FACULTY VACANCY NOTICE

The faculty position listed below is currently available at the University of North Alabama, BIOLOGY Department, Florence, Alabama:

NON-TENURE-TRACK INSTRUCTOR OR ASSISTANT PROFESSOR

FACULTY POSITION SUMMARY

The University of North Alabama is accepting applications for a non-tenure-track appointment at the rank of Instructor or Assistant Professor in the Department of Biology beginning on August 19, 2002. A minimum of a master's degree and 18 graduate hours in biology is required. Salary will be based on qualifications and experience. Primary duties will consist of teaching 9 semester hours of introductory biology and coordination of freshman biology laboratories. This coordination will include preparation of materials for laboratories, supervision of student workers, maintenance of proper supply inventories, and other appropriate duties. In addition, the faculty member will be expected to hold 10 office hours per week, serve on university committees, and advise students.

Submit a letter of application, accompanied by a detailed resume (including transcripts) and the names, addresses, and telephone numbers of three references to: Director of Human Resources and Affirmative Action, University of North Alabama, UNA Box 5043, Florence, AL 35632-0001. Review of applications will begin November 26, 2001. Applications will be accepted until the position is filled.

UNA is an equal opportunity employer committed to achieving excellence and strength through diversity. UNA seeks a wide range of applicants for this position so that one of our core values, ethnic and cultural diversity, will be affirmed.

Date Posted: November 13, 2001

Materials Accepted Through: Until Filled

OFFICE OF HUMAN RESOURCES AND AFFIRMATIVE ACTION

Bibb Graves Hall, Room 222

University of North Alabama

UNA Box 5043

Florence, Alabama 35632-0001

Telephone (256) 765-4291 Fax (256) 765-5998

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ALL TAXA BIODIVERSITY INVENTORY NEWS

The following articles have been reprinted with permission from the Autumn Newsletter 2001 (Vol. 2, No. 4), ATBI Quarterly.

Mining Beetle Diversity in the Smokies

Chris Carlton

During June, a team of specialists from the Louisiana State Arthropod Museum (LSAM) participated in the Beetle Blitz along with a large contingent of other scientists, volunteers, and Upward Bound students. This was a wonderful event and a great way to jump-start the beetle diversity project. We and other ATBI beetle specialists are now sorting and identifying the proceeds of these collections.

How many beetle species are there in the Smokies? When asked this question at the media event during the blitz, I confidently said 6000, a figure that was picked up by the Associated Press and quoted enough times in newspapers around the country to make it sound plausible, and make me feel compelled to defend it. Less commonly quoted was my statement to the effect that I was curious to discover how wrong I would be when the results were final. In their 1998 checklist, S. Peck and M. Thomas recorded 4675 beetle species from Florida, but emphasized that their list was only the beginning of understanding beetle diversity in the state. In eastern Oklahoma, coleopterist Karl Stephan collected over 3500 species from Latimer County (189,540 hectares) during approximately 20 years of effort. At 221,000 hectares, the Park is comparable in area, but has dramatically greater topographic relief, habitat diversity and a moister climate, all of which promote high levels of diversity and local endemism (species restricted to a small area). Given these conditions for maximizing species diversity and our current incomplete state of knowledge of many beetle groups, I felt that a figure of 6000 was a reasonable upper limit.

So which habitats will yield the most beetle species? Our LSAM team will concentrate survey efforts on one of the least understood habitats in the Park, forest litter. This stratified forest floor habitat has a top layer of freshly fallen leaves and woody debris and extends through a series of zones of finer organic matter to a basement of subsoil and bedrock. Beetles are one of the most diverse insect Orders in this habitat niche and exhibit an amazing array of life history strategies and body forms, mostly in Lilliputian sizes (as small as 0.5 mm). Many subsist on the abundant and diverse fungal decomposers of plant debris. Families of beetles such as hairy fungus beetles (Mycetophagidae), handsome fungus beetles (Endomychidae), pleasing fungus beetles (Erotylidae) and feather-winged beetles (Ptiliidae) all graze on mycelia and spores in the moldy litter, or feed on fruiting bodies (e.g., mushrooms) that emerge from it. Other litter beetles are predatory, while a few feed directly on dead plant material or spend time in the litter only during their larval stages. The subjects of my own research are the predatory short-winged mold beetles (Pselaphinae, one of several large subfamilies of staphylinid, or rove beetles). Some, such as the bizarre-shaped *Adranes lecontei*, live in intimate association with ants. Their complete integration into the social order of ant colonies is associated with the

evolution of specialized glands that produce secretions that the ants find irresistible. They are in turn fed by the ants through a specialized kind of regurgitation called trophallaxis, and are generally cared for by the ants and treated somewhat like pets. Though considered to be rare, we collected a nice series of them in litter samples during the Beetle Blitz, an example of what can be accomplished using specialized techniques. Many other species of short-winged mold beetles are restricted to GRSM and adjacent mountains. Some species are known only from single localities and some from only a single individual!

These are the kinds of arcane coleopteran jewels that will send beetle diversity in the Smokies to my now famous (or infamous) 6000 species estimate. Give us 10 years and we'll prove it! You can track progress on the beetle species count by logging onto the Smokies Coleoptera TWIG website at www.agctr.lsu.edu/arthropodmuseum/smokybeetles.htm.

Chris Carlton, Louisiana State University, ccarlto@unix1.lsu.edu.

Dictyostelids Are Slime Molds Too

John Landolt

Dictyostelid cellular slime molds, like their bigger, flashier myxomycete slime mold cousins, play a role in influencing the size of decomposer bacteria populations living in soil and decaying leaf litter. In turn, cellular slime molds are utilized as food by protozoa, nematodes, small arthropods and other small creatures.

As individual amoebae, cellular slime molds may engulf and digest bacteria at such a rate that a small, local population of bacteria within a cubic centimeter may be decimated. When this obliteration of the bacterial food supply occurs, a truly amazing transformation of the slime mold takes place. Thousands of cellular slime mold amoebae that had been operating as independent single-celled organisms, begin to stream together to form aggregations from which arise larger, multicellular entities. Each multicellular pseudoplasmodium, behaving now as a single creature, moves in response to light and chemical stimuli, eventually develops different, specialized cell types, and rearranges itself to form a stalked structure bearing one or more packets of dispersible spore cells.

Spores may remain dormant for months or germinate in a short time to liberate more amoeboid cells to feed on replenished bacteria. The spores may be ingested inadvertently by birds, rodents, or amphibians foraging for food on the ground. After passing unharmed through the animals' digestive system, these spores can be redeposited in a different locale to germinate and devour fresh supplies of bacteria. Viable cellular slime mold spores have been recovered from the wings of moths that have emerged from cocoons in the ground. Spores also have been found in the droppings of bats that feed on these moths. Evidence exists that migratory songbirds regularly may ingest and transport spores for hundreds, or even thousands of miles between the tropics and higher latitudes.

There are almost 100 described species of cellular slime molds in the world. The tropical zone of the western hemisphere is home to the largest variety of forms, but it is likely that up to 25-30% of these cellular slime mold species have distributions that overlap the borders of Great Smoky Mountains National Park.

However, since all of the life stages of cellular slime molds are essentially microscopic, it is almost impossible to observe them in the field. Laboratory culturing from field collected soil and litter material is required.

Prior to the ATBI initiative, about 10 species of this group had been recorded from the Park. In just the last three years, the number of species on this list has more than doubled. Survey work for discovering cellular slime mold distributions has been conducted in only a few sites so far, with many areas in the Park yet to be examined.

The cellular slime mold ATBI project has become an example of a collaboration not only among the individuals the Slime Mold TWIG, but also with many others, including members of other ATBI groups. Others who have become involved in the cellular slime mold component of the ATBI are undergraduate students Melissa Bolt of Northern Virginia Community College (field collections) and Nancy Critzer from Shepherd College (laboratory processing and analysis). DLIA Volunteers David Stairs and Nancy Lowe have participated in making field collections. Park personnel Chuck Parker and Ian Stocks have made field collections of soil and litter material to be examined for cellular slime molds. Will Reeves (Clemson University), in the course of his ATBI entomology work, has collected soil samples from caves within the Park which have yielded interesting cellular slime mold records. The Tree Canopy Biodiversity group headed by Harold Keller (Central Missouri State U.) provided sample litter material from the forest canopy that contained a cellular slime mold record.

Cellular slime molds are likely to occur in almost any setting. Interesting species, including new and different forms, may occur in any number of microhabitat types that exist in the Park where aerobic decomposition of litter by bacteria takes place. If there are any other ATBI investigators or volunteers working in situations of this sort and who would like to collect sample material to process for the recovery of cellular slime molds, please contact me.

John C. Landolt, Shepherd College, jlandolt@shepherd.edu

Smoky Mountain Reptiles

Ben Cash, Joshua Ennen, and James Webb
Maryville College, Maryville, TN

The reptile inventory of the Great Smoky Mountains National Park is in full swing. Dr. Ben Cash, assistant professor of biology at Maryville College, and two junior MC biology majors, Joshua Ennen and James Webb, spent the summer months intensively sampling localities throughout the Park.

There are 36 reptile species recorded from Great Smoky Mountains National Park. However, many of these records are based on a few individuals (or sometimes just one), leaving little knowledge of the distribution of most species. Montane habitats of the Southeast are not generally known for their reptile diversity. Add to that the very cryptic nature of most reptile species and 221,000 hectares to cover, and this in large part explains why there is so little information on occurrence and distribution of reptiles in the Park.

A variety of methods are being used to shed light on the species richness and distribution of reptiles in the Park, starting with simply putting a lot of hiking miles under our belts. Turning rocks and logs, the tried and true method of

ground-pounding herpetology, is being applied. This method is typically fruitful and large geographic areas can be covered. In an effort to diversify our sampling techniques, we are also placing temporary drift fences with screen funnel traps at selected areas in an effort to catch individuals on the move, particularly snakes. Roofing tin has been spread at various sites and has proved to be very successful. Animals found dead-on-the-road are being collected (we owe a debt of gratitude to Park Ranger's for their assistance). Turtle trapping is being conducted in streams, rivers and impoundments in the Park. And finally, historic records from museum data are being collected to provide more distributional information.

Currently, no species new to the Park have been recorded, but much new information has been gathered to better understand the distribution of reptile species in the Park. For instance, we have increased the species richness of reptiles in Cades Cove from 14 to 20 species. And thanks to efforts by Dr. Ken Dodd and his amphibian crew, and to our trapping efforts this summer, we have re-confirmed the common map turtle in Abrams Creek (previously based on one anecdotal account), and have a better picture of its occurrence along the creek.

Our ATBI activities have also provided us with outstanding educational opportunities. Drift fences (and soon tin) have been placed at the Tremont Institute (thanks to Paul Super) and at Purchase Knob (thanks to Susan Sachs). Our endeavors are also providing valuable experience to students from Maryville College and other institutions in all aspects of the project, from web page design and content, to various aspects of biological fieldwork.

In short, a lot of ground has been covered to this point, but much work is ahead. Thanks to Janice Pelton and all the Park staff at Twin Creeks, and to Jeanie Hilten for her excellent assistance. Anyone interested in contributing to the reptile inventory please contact me.

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Independent Fern Gametophytes

Paul Davison

Fern gametophytes (plants that alternate generations; the haploid, gamete-producing phase) aren't typically thought of when considering fern diversity. Yet Great Smoky Mountains National Park is home to three of the fern gametophyte species known to science. These species were named in the early 1990's by Don Farrar of Iowa State University and his colleagues. Named from perennial gametophytic populations that have apparently lost the ability to produce sporophytes, *Vittaria appalachiana*, *Trichomanes intricatum*, and *Hymenophyllum tayloriae* are small plants only millimeters long and quite different from the typical fern gametophytes illustrated in general biology texts. These gametophytes grow in filamentous and branching, ribbon-like forms. They are usually interpreted to be relicts from the much warmer Tertiary Period when sporophytic (spore-producing, diploid phase in a life cycle characterized by alternation of generations) populations of the species presumably occurred.

When changing climatic conditions of the Pleistocene, it is postulated that the sporophytes became extinct and the gametophytes persisted in rock crevices and rock underledges where they may still be found today. The persistence of

gametophytes is possible due to their production of gemmae (a small mass of vegetative tissue) from perennial gametophyte plants. Gametophytic gemmae, which are specialized means of asexual reproduction, are known only in three fern families, all tropical: Vittariaceae, Hymenophyllaceae, and Grammitidaceae. Each family is represented in the Southern Appalachians by independently reproducing gametophytic populations. Grammitidaceae is represented by *Grammitis nimbata* (known from a single locality in Macon Co., N.C. and functional sporophytes in the West Indies). Vittariaceae is represented by *Vittaria appalachiana*, the most common of all the gametophyte species and was first collected in east Tennessee by Aaron John "Jack" Sharp in 1930. Hymenophyllaceae is represented by two gametophytic species, the widespread *Trichomanes intricatum* (Vermont to Alabama) and the much rarer *Hymenophyllum tayloriae* which was until recently, known from northwest Alabama and a few counties in the narrow region bordering North Carolina, South Carolina, and Georgia.

This summer, *Hymenophyllum tayloriae* was added to the known flora of Tennessee and Great Smoky Mountains National Park. Three populations were found in the Park during two days of field surveys sponsored by the Tennessee Natural Heritage Program and the U.S. Fish and Wildlife Service. Individual plants are nearly microscopic, typically only a few cells wide, and were found with the aid of a flashlight and close examination of rock ledges along stream ravines. To see images of *Hymenophyllum tayloriae* and the other species of independent fern gametophytes, see the web site: <http://www.goldsword.com/sfarmer/ATBI/>.

Paul Davison, University of North Alabama, pdavison@unanov.una.edu.

The Hidden Diversity Inside Biting Flies

Will Reeves

Of all the insects in the Park, biting flies are one of the few groups encountered by most visitors. Few people can honestly say that a mosquito has never bitten them and most visitors can identify mosquitoes, black flies, punkies, deer flies, and horse flies. Biting flies are among the best-studied groups of insects because they are the single most destructive group of animals in the world. Blood-feeding flies transmit viruses, bacteria, protozoa, and worms to their hosts. These same flies also play host to their own symbiotic organisms. In truth, insect symbionts (an organism living in association with a dissimilar organism) are among the most diverse taxa in the world. Almost every insect species has at least one species-specific symbiont and some insects can have a dozen symbiotic species. To start cataloging the diversity of symbiotic organisms in the Park, we needed to focus our efforts on taxonomically well-known hosts. Great Smoky Mountains National Park has over 100 species of biting flies and we expect at least 100 species of symbionts to be associated with these flies. This number could easily exceed 1000. Biting flies are the ideal group for this study, because most are identifiable to species and are easy to collect. Eleven families of biting flies might be found in the Park and that means the symbiont diversity could be enormous.

My advisor Peter Adler and I received a DLIA grant for the first multi-TWIG based study focusing on biting flies and their symbionts. Biting flies fall under the Diptera TWIG, but their symbionts include other arthropods, bacteria, fungi,

nematodes, nematomorphs, platyhelminths, protozoa, viruses, and even plants. The initial results from our survey indicate that a significant amount of the diversity in the Park may be among the symbionts of insects.

Sampling biting flies involves collecting larvae from tree holes, streams, and roadside ditches or trapping adults with nets and dry ice baits. To isolate and identify symbionts, the flies must be kept alive and examined in a laboratory under a microscope. Detection of symbiotic organisms often involves hundreds of fly dissections before the symbionts are discovered. Preservation and identification often involves hazardous chemicals, electron microscopy, or molecular techniques. Some parasitic organisms must be reared to the adult stage or cultured before they are identified. The species composition of both flies and their symbionts changes with the weather and season. Weekly collections of biting flies allow us to monitor species changes in both the symbionts and hosts during the year.

This summer we collected and identified over 30 species of biting flies from the Park. These include several new state or Park records for black flies and mosquitoes. Two undescribed black flies were collected in the Park, and we expect to find several other undescribed flies. The symbiont diversity has been exceptional. An insect virus was detected in the Park's tree hole mosquitoes. A previously unreported pathogenic bacterium was isolated and identified from black fly larvae in North Carolina. A possible new microsporidian parasite of mosquitoes was also discovered. We have identified over six species of symbiotic trichomycete fungi from black flies and mosquitoes and one of these is potentially undescribed. Trypanosomatids and a complex of parasites have been identified in mosquitoes, black flies, and deer flies from the Park, and some of these include probable new species, state, or Park records. Symbiotic ciliates have also been identified from mosquitoes in the Park, some of which are benign commensals, but others appear to be parasitic.

The world's first record of a larval nematomorph (horse-hair worm) in a larval black fly was made from a seepage on the North Carolina side of the Park. Four species of nematomorphs have been identified from the Park, and some of these use flies as intermediate hosts. On a more ominous note, a nematode resembling dog heartworm was dissected from a mosquito at the Oconaluftee Visitor Center, and a possible new species of insect pathogenic nematode was found in 25% of the larval black flies in the Mingus Mill millrace. Even other arthropods are parasitic on biting flies. Parasitic mites were discovered feeding on mosquitoes in the Parks. Overall the symbiotic fauna associated with biting flies is diverse and under-reported. All of this points to the possibility for a richer fauna in the more diverse groups like Coleoptera or Hymenoptera to exist.

I urge anyone working under a valid permit in the Park who encounters biting flies to collect them. I am very interested in examining any fly that bites you or animals you are working with. We know very little about the feeding habits of biting flies on wildlife; even amphibians are preyed upon by some species of mosquitoes and screw-worms. With the growing interest in West Nile Virus and other insect-transmitted pathogens, the results of our research will be useful in understanding wildlife and human diseases in the park.

Will Reeves, Clemson University, wreeves@clemson.edu.

Underfoot and All Around

Ernest C. Bernard

I have been using the above phrase for a year or more to try to convey how completely surrounded we are by thousands of species, many unknown, regardless of where we are. A great mystery of the All Taxa Biodiversity Inventory in Great Smoky Mountains National Park is the actual number of arthropod species. Whereas vertebrates are well enumerated, we have just foggy guesses on most arthropod Orders. A statement commonly heard before the ATBI really started rolling was, "We've got a good list of that Order, U. Seeum compiled it back in the 1960s." But Betty Doesn't quickly finds that the once-impressive list is missing many species because Seeum and his predecessors collected along roads during the tourist season and missed many important plant associations. So it is playing out in projects that Chuck Parker and I are now heading. For instance, Matt Petersen's ongoing study of crane flies (Tipulidae), a supposedly well-documented group in GRSM, has yielded numerous new Park records and several new species, including one more than an inch long. Since the larvae of many Tipulidae are terrestrial, they must have considerable specialization for different microhabitats, of which almost nothing is known in GRSM.

Detrital food webs in temperate mixed forests are exceedingly complex, and so we can expect to find different species arrays at each node. Each species occupies a unique multidimensional niche comprised of food source, space, soil pore size, moisture, seasonality, and so forth. Thus, in a single litter sample we will find numerous predator taxa, each specializing in prey of a certain size or type. At the top end are scolopendrid centipedes, some several inches long, which possess powerful poison fangs for attacking beetles, millipedes, and spiders. All spiders and many beetles themselves are predacious, but they tend to use smaller and softer prey, such as insect larvae among the larger beetles, and springtails and diplurans among the smaller beetles. Japygids have powerful pinching cerci for manipulating any soft-bodied prey they can catch. Pseudoscorpions, less than 5 mm long, are specialists on small Collembola and other tiny arthropods. Mites, tardigrades, and predacious nematodes all feed on soil nematodes, the most abundant invertebrates on earth. Enumerating the biota of the Park will enable us to understand niche breadths and provide at least a qualitative understanding of species interactions.

Unexpected pleasures for the eye also can be found among the humble inhabitants of soil and litter. In preservative, a common Smokies springtail, *Tomocerus elongates*, is light yellow with thin purple marginal stripes, because its dense scales are instantaneously dislodged by immersion. But if live specimens are collected and maintained in culture until they molt, a breathtakingly beautiful animal appears, as splendidly and intricately patterned as any butterfly, with bold stripes, checkerboard patterns, and shimmering iridescence. As much as good data, such unexpected delights make these projects worthwhile.

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REVIEW

James Ross, *Review Editor*
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Dodd, C.K. 2001. American Box Turtles, A Natural History. University of Oklahoma Press, Norman, OK. \$59.95. 231 pages.

C.K. Dodd provides an excellent review of the natural history of box turtles in his appropriately named book, *American Box Turtles, A Natural History*. Dodd attempts to bridge the gap between the more avid amateur turtle naturalist and the more seasoned researcher, and he does an admirable job. He explains the basic tenants of ecology, evolutionary biology, and systematics as related to box turtle natural history on a level that is understandable to the amateur naturalist but not tedious to the researcher.

Dodd's book provides a thorough overview of proposed evolutionary relationships among the four extant species included in the genus *Terrapene* as well as their evolutionary history. He also presents arguments for possible phylogenetic relationships between *Terrapene* and four other closely related genera. Dodd in no way claims to present the definitive evolutionary history of box turtles nor relationships among extant box turtles. Rather, he presents several proposed relationships and provides readers with access to the research material.

This book provides readers with information regarding nearly every aspect of box turtle natural history imaginable. Included chapters cover such topics as habitat requirements, movement, behavior, reproduction, feeding, population demographics, predators and disease, and finally, conservation. Each of the chapters provides a brief introductory section describing the purpose and scope of the chapter as well as including some personal anecdotes and references to specific studies. The introduction is followed by detailed information that covers the topic very thoroughly with reference to original and current literature. Each chapter concludes with suggestions for further study.

Dodd is quite passionate with regards to the conservation of box turtles. Within the conservation chapter, Dodd notes possible impacts on box turtle populations as the historical demands on them as food, decorative, or ceremonial items increased and decreased respectively. However, he points out that more recent declines in box turtle populations are undoubtedly due to loss of habitat. To Dodd, the issue of habitat loss is extended to include the associated issues of habitat fragmentation and increased risks and impact associated with predation, injury, and disease in slowly dwindling populations. For those not familiar with the less reputable pet industry, the section on commercial trade will be an eye-opener. One of the main points a reader will take away from the conservation chapter is that too little is known about box turtle requirements and the adverse effects human activities have on box turtle populations. An extremely informative section briefly lists the state, national, and some international regulations

regarding box turtles. This is another eye-opener, primarily for the amateur who has not dealt with applications for research collecting permits. Although Dodd presents the primary problems and potential solutions regarding box turtle conservation, one finds this chapter producing more questions than answers. This is rightly so because as Dodd points out, too little is known about box turtle ecology. Unfortunately, this chapter leaves a doom and gloom impression.

The addition of a key to *Terrapene* species and subspecies at the end of the book is extremely valuable for those individuals who have not yet encountered all subspecies of North American box turtles but are likely to go looking for them. In addition, the species accounts section is extremely interesting for the person who enjoys understanding the history of a species and the etymology of genus and species names. Dodd also includes distribution maps and detailed descriptions for the 'definitive' identification of species and subspecies as well as descriptions of sexual dimorphisms and hatchlings.

This book is a very informative account of box turtle natural history and should by no means be considered another coffee table book. The book will be very useful to both the amateur turtle enthusiast as well as the researcher. I was impressed with Dodd's ability to write at a level suitable for both audiences. Dodd's references to both the historical and current literature is extremely beneficial to anyone with a serious interest in box turtle ecology. His references to personal experiences provide informative entertainment.

PAT C. CLARK, Utah State University.

NEWS OF BIOLOGY IN THE SOUTHEAST

Jon R. Fortman--*News Editor*
Division of Science and Math
Mississippi University for Women
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ABOUT PEOPLE AND PLACES

NORTH CAROLINA

Highlands Biological Station, Highlands, NC. The Station is an interinstitutional center of the University of North Carolina, located in the Southern Appalachian Mountains at an elevation of 4,000 feet. A recent article in *BioScience* identified this region as a hot spot for diversity of, among others, salamanders, land snails, trees, and fungi. Facilities at the research lab include refrigerators, ultra-cold freezers, microscopes and field sampling equipment. Also, there is a research library, an aquatics lab with six large indoor aquariums, two walk-in environmental chambers, and dormitories and kitchens for use by researchers. Grants-in-aid and scholarships are available to predoctoral graduate students and postdoctoral investigators for the support of research on the habitats and organisms of the Southern Appalachians. Applications for grants are reviewed by the Board of Scientific Advisors, representing the 33 colleges and universities in the Southeast that belong to the Highlands Biological Foundation, Inc. Forms can be obtained from Dr. Robert Wyatt, Executive Director, Highlands Biological Station, P.O. Box 580, Highlands, NC 28741. Applications can also be downloaded at <http://www.wcu.edu/hibio>. The deadline for returned applications is 1 March 2002. The following are course offerings for 2002:

Biology of Plethodontid Salamanders, May 20-June 1 (3 hrs. credit), Steven G. Tilley (Smith College), instructor. Prerequisites: general biology, ecology, or instructor permission.

Biology of Birds, June 3-15 (3 hrs. credit), Rob Bierregaard (UNC-Charlotte), instructor. Prerequisites: general biology, ecology, or instructor permission.

Biology of Freshwater Fishes, June 17-29 (3 hrs. credit), Edward F. Menhinick (UNC-Charlotte), instructor. Prerequisites: general biology, ecology, or instructor permission.

Behavioral Ecology of Social Insects, July 1-13 (3 hrs. credit), James T. Costa (Western Carolina University), instructor. Prerequisites: general biology, entomology (recommended, or instructor permission).

Fleshy Fungi of the Highlands Plateau, July 15-27 (3 hrs. credit), Andrew S. Matheny (Eastern Illinois University), instructor. Prerequisites: general biology, ecology, or instructor permission.

Costs include a course fee of \$400 per 2-week course, charged to all students. Registration may be done through Western Carolina University (\$35 application fee and \$54 registration fee), or UNC-Chapel Hill (\$80 registration fee). Housing costs are \$40/week.

MUSEUMS AND BOTANICAL GARDENS

ALABAMA

Anniston Museum of Natural History. Mayor Chip Howell and Museum Director Cheryl Bragg recently announced that the Museum of Natural History has been accepted as an Affiliate of the Smithsonian Institution. The affiliation will allow the Museum to obtain Smithsonian collection objects for a long-term exhibition. Each year, Anniston Museum serves more than 100,000 children and adults through museum exhibits and programs, outreach programs in schools, libraries, shopping centers, and educational publications. The Museum will open a new exhibit hall--"Ancient Egypt"--in April 2002. The new hall will feature the museum's 2,300-year-old Egyptian mummies.

Proposed Dues Increase

The ASB Executive Committee recommends an increase in some categories of dues to cover increased operating expenses. The membership will be asked to approve this recommendation at the Friday, April 12, 2002, Business Meeting in Boone, North Carolina.

<u>Dues Categories</u>	<u>Current Dues</u>	<u>Recommended Dues</u>
Regular	\$20.00	\$25.00
Regular for 3 years	\$50.00	\$65.00
Family	\$25.00	\$30.00
Student	\$10.00	\$15.00
Emeritus	\$10.00	no increase
Contributing	\$50.00	no increase
Sustaining	\$100.00	no increase
Patron	\$500.00	\$750.00
Library	\$30.00	no increase
Library for 3 years	\$85.00	no increase

Inventory Reduction Sale

Brimleyana, published by the NC State Museum of Natural Sciences between 1979 and 1998 served as a comprehensive journal for zoology and ecology of the southeastern United States. Numbers 2-25 (1 is out of print) of this journal are now available as a set for \$50, postpaid. Send check (no purchase orders or credit cards) payable to "Museum Extension Fund 2465" AND self-addressed adhesive mailing label to: Busack, NCSM, 11 West Jones Street, Raleigh, NC 27601-1029, to receive your set.

–For more information or questions, contact Dr. Stephen Busack, telephone (919) 733-7450, Extension 701, e-mail address: Steve.Busack@ncmail.net.


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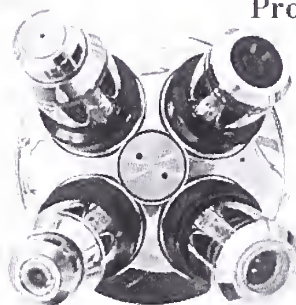
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